designs. Chapter 7 covers analysis of covariance. Chapters 8–10 discuss repeated measures, latin and greco-latin squares and their incorporation into crossover studies. Chapters 12–13 cover factorial designs, split plot designs, and confounding. An excellent discussion of sample size is included in the appendix.

Clinical investigators and biostatisticians will find this text a valuable addition to their reference library. I recommend this text strongly to those engaged in the design and analysis of clinical experiments.

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An Introduction to Multivariate Statistical Analysis, 2nd edn. By T. W. Anderson. 675 pp. Wiley, New York (1984).

This book is the 2nd Edn of the author's 1957 book of the same title. This book could serve as a textbook for a second graduate level course in mathematical statistics or as a reference for professional researchers. The author's treatment of the subject is mathematical in nature; the basic format is theorem and proof. Data analysis and statistical methods are not the theme of this book; nor is there any reference to the role statistical software packages play in multivariate analysis. A working knowledge of linear algebra would be helpful; however, the book contains an appendix on that subject highlighting the most important results.

Most of the classical topics of multivariate analysis are presented. The author begins with a rather thorough presentation of the multivariate normal distribution. He then describes multivariate normal parameter estimation and hypothesis testing. He also includes alternatives to the classical estimation procedures, such as Bayes and Stein estimators. There are chapters on discriminant analysis, MANOVA, principal components, and canonical correlations. New material includes a chapter on factor analysis, a discussion of Stein procedures, and some work on simultaneous equations models.

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Advanced Graphics with the IBM Personal Computer. By I. O. Angell. Wiley, New York (1985). 273 pp.

Advanced Graphics with the IBM Personal Computer provides a detailed insight into one of the most formidable bastions in computer programming, that of computer graphics. All of the sourcecode is presented in BASIC, which is, in this reviewer's opinion, the most amiable choice, considering the variety of graphics commands available with BASIC and the painlessness of the trial and error approach involved with a new subject, if BASIC is new to the reader.

Following the authors suggested method for using the book, the reader will acquire quite a library of graphics tools, in a modular form. This approach affords the reader a variety of avenues for experimentation.

The book is filled with example programs, figures and pictures, each one detailed in the text. The implementations are, by the authors own admission, not concise, that is, the coding used

throughout could be made much tighter. The author contends that such an approach would tend to overshadow the real purpose of the text. This is an extremely sensible observation and the verbose coding presented allows the reader to grasp the fundamentals much more easily. Subjects include three-dimensional representations in two dimensions, matrix transformations, three-dimensional coordinate systems, orthographic projections, stereoscopic projections and several interesting hidden line and hidden surface algorithms.

The book has appeal to anyone interested in computer graphics. For those with a comfortable mathematics background and a desire to learn the details of sophisticated graphics display algorithms, the book provides a wealth of information. In contrast, those who are more interested in creating graphics displays without the accompanying theory, can mix and match the example modules into their own custom programs. The author provides good descriptions of the BASIC graphics commands, but a good working knowledge of BASIC would be a great advantage to the prospective reader.

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Technical, Technological and Social Implications of Bioengineering (Implicaţii tehnice, ţehnologice şi sociale ale bioingineriei). By E. Niculescu-Mizil. Editura Stiinţifică şi enciclopedică, Bucureşti (1982) 240 pp. 13 lei.

In our days, biology and its applications has obtained a special importance and interest. Much more, the forecast in this domain of science points to a stronger and more revolutionary development for the time being. These facts are due to numerous discoveries of scientific and practical value in the field of biology in the last 20 y. In these circumstances, the biological research must have proper attention in the future. For instance, in Romania, the programmes of scientific research of technological development and of technical progress for the last two decades of the twentieth century, there are foreseen special measures for the biological research. This book is, and would be directed towards the deepening of knowledge of fundamental biological mechanism and the development on this foundation of applications in agriculture, industry, medicine and environmental protection. Research is developed in the field of cellular and molecular biology, biochemistry, of biophysics, bioengineering, genetics and ecology.

The biological research must be directed not only towards the cognition of life and nature mysteries but also towards taking advantage of results of knowledge in the view of the transformation of nature for the human benefit.

Thus, one of the peculiarities of the development of biological research in Romania is its orientation towards obtaining new kinds of plants of high productivity, with better nourishing qualities, as well as towards the improvement of animals breed.

However, the deepening of knowledge about the fundamental biological mechanisms required by the application of biology in practice is unconceivable without the deep cognition of the nature of living matter. This means that the scientific cognition of the discussed about domain is refered to as this last problem, while the applied biological researches involve close relations between biology and the most different methods and techniques as those of industrial biotechnology, genetic engineering, medical technologies etc. This means that biology will be able to answer succesfully to the great charges of social economic development which are standing before it not only by the organic blending with different domains of modern techniques.

Till now the relationships of biology with different domains of techniques were generally presented with each domain separate from the other ones.

The work *Technical, Technological and Social Implications of Bioengineering* tries and succeeds in doing a synthetic and unitary presentation of these problems, joining all in a single and complex